

Remarks/Arguments

Claims 1-3 and 5-25 remain in the application. Claim 4 has been canceled. Claims 2, 3, 5, 7-9, 11, 12, 15, 23, and 25 have been amended. Claims 26-31 have been withdrawn. Claims 32-34 have been newly added.

Election/Restrictions

Applicant's election of claims 1-25, Group I, is acknowledged.

Applicant reserves the right to file the non-elected claims 26-31 by divisional.

Claim Objections

Claims 3, 4, 7-9, 11, 12, 15, 23, and 25 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claims 3, 7-9, 11, 12, 15, 23, and 25 have been amended to place the claims in proper dependent form. The amendments do not add new subject matter.

Claim 4 has been canceled.

Claims 2 and 5 are objected to because of the following informalities: In the above claims, a "forth" processing cell is recited, it was assumed, for examination purposes, that this term was intended to be a "fourth" processing cell.

Claims 2 and 5 have been amended correcting a typographical error in order to recite a "fourth" processing cell. Furthermore, claim 5 has been amended to correctly recite "the fourth processing cell" and "fourth thermochemical processing conditions". The amendments do not add new subject matter.

Claim Rejections 35 USC § 112

Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph. The above claims are indefinite because the term “the forth port” on line 3 of instant claim 2 lacks any antecedent basis.

Claim 2 has been amended in order to recite “a fourth port”. The amendment does not add new subject matter.

Claim Rejections 35 USC § 102

Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Pelissier (US Patent 6,065,964).

Pelissier teaches a modular vacuum thermal processing installation. The installation includes several processing cells linked to an air-tight chamber. For example, in column 3 lines 5 to 10 Pelissier teaches an installation comprising two carburizing cells – thermochemical processing cells - which enable processing of two loads at a same time.

Referring to independent claims 1, 6, and 10, Applicant discloses and claims a multi cell thermal processing unit comprising thermochemical processing cells linked to an air tight common chamber. The multi cell thermal processing unit of the instant application is further defined by the limitation of the thermochemical processing cells for providing “substantially fixed thermochemical processing conditions”. The substantially fixed thermochemical processing conditions are atmosphere composition, temperature and pressure as disclosed in paragraph 32 of the detailed description in the instant application.

Independent claim 6 further comprises the limitation of a first thermochemical processing cell for nitriding a workpiece and a second thermochemical processing cell for second nitriding treatment of the workpiece. Thus, the limitations of claim 6 define a multi cell thermal processing unit for nitriding a workpiece with the nitriding process being divided into two steps, each performed in a separate thermal processing cell providing substantially fixed thermochemical processing conditions.

Referring to independent claim 22, Applicant discloses and claims a multi cell thermal processing unit comprising a first and a second thermochemical processing cell linked to an air tight common chamber, the first thermochemical processing cell for providing “a first portion of thermochemical processing conditions of a thermochemical processing process for thermochemical processing a workpiece”, the second thermochemical processing cell for providing “a second portion of the thermochemical processing conditions of the thermochemical processing process for thermochemical processing the workpiece”.

Dividing the thermochemical process into a plurality of steps performed under substantially constant conditions or under conditions which are only changed within a portion of the range of operating conditions for a complete thermochemical process has numerous advantages for modern thermochemical processing applications. For example, combining various different thermochemical processing steps into one set of thermochemical processing conditions for processing a workpiece allows implementation of a large number of different sets of thermochemical processing conditions using a fixed number of thermochemical processing cells being smaller than the number of sets of thermochemical processing conditions realized. Further, numerous sets of different thermochemical processing conditions are provided in parallel without changing operating conditions in each of the thermochemical processing cells. Changing the operating conditions within a thermochemical processing cell requires a substantial amount of time and energy. Therefore, keeping the operating conditions in each of the thermochemical processing cells constant or varying these conditions only within a portion of the range of operating conditions for a complete thermochemical process provides considerable time as well as energy savings. It also allows use of thermochemical processing cells, which are operable within a narrow operating range allowing for considerably reducing manufacturing costs of each of the thermochemical processing cells. Additionally, operating a thermochemical processing cell under substantially constant conditions reduces material fatigue prolonging its lifetime.

While Pelissier teaches a multi cell thermal processing unit he is silent about this highly advantageous and highly inventive aspect of the multi cell thermal processing unit defined by the limitations of independent claims 1, 6, 10, and 22 of the instant application.

Therefore, Applicant respectfully submits that the multi cell thermal processing unit defined by the limitations of claims 1, 6, 10, and 22 is highly inventive and not anticipated by Pelissier.

Independent claim 6 has been amended to correctly recite “the workpiece” in the last line of the claim. The amendment has been made to correct an error in the originally submitted claim and not for reasons of patentability. The amendment does not add new subject matter.

Applicant respectfully submits that claims 2, 3, 5, 7-9, 11-21, and 23-25 each depend on a claim that is believed to be allowable and as such are allowable.

Dependent claim 4 has been canceled.

Claims 1 and 6-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokose et al. (US Patent 5,868,871).

While Yokose et al. teach a multi cell thermochemical processing unit they are silent about the thermochemical processing cells for providing substantially fixed thermochemical processing conditions, or providing thermochemical processing cells for dividing the thermochemical processing of a workpiece into a plurality of steps each performed in a different thermochemical processing cell. In particular, in column 10 lines 1 to 61 Yokose et al. teach charging a workpiece into a carburizing cell from a preheating cell and performing the complete carburizing process with substantially varying conditions within the carburizing chamber. When the carburizing process is finished the workpiece is then transported to a cooling chamber for further non-thermochemical treatment.

Therefore, Applicant respectfully submits that the multi cell thermochemical processing unit defined by the limitations of claims 1, 6, 10, and 22 is highly inventive and not anticipated by Yokose et al.

Applicant respectfully submits that claims 7-9, 11-21, and 23-25 each depend on a claim that is believed to be allowable and as such are allowable.

The limitations of newly added independent claim 32 defines a multi cell thermochemical processing unit for implementing thermochemical processing of a workpiece in a plurality of stages using a plurality of thermochemical processing cells, each thermochemical processing cell for providing substantially fixed thermochemical processing conditions. Therefore, Applicant respectfully submits that new claim 32 is allowable for the above reasons.

Newly added claims 33 and 34 each depend on a claim, which Applicant believes is allowable and as such are allowable.

The new claims 32-34 have been added to more clearly define the multi cell thermochemical processing unit for implementing thermochemical processing of a workpiece in a plurality of stages according to the present invention and not for reasons concerning patentability. The newly added claims do not add new subject matter.

Applicant looks forward to favourable reconsideration of the present application.

Please charge any additional fees required or credit any overpayment to Deposit Account No: 50-1142.

Respectfully submitted,



Gordon Freedman, Reg. No. 41,553

Freedman and Associates
117 Centrepointe Drive, Suite 350
Nepean, Ontario
K2G 5X3 Canada

Tel: (613) 274-7272
Fax: (613) 274-7414
Email: gordon@ipatent4u.com

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